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(71) Applicant *(for all designated States except US)*: VG ELEMENTAL LIMITED [GB/GB]; c/o Thermo Elemental Limited, Pickfords Wharf, Clink Street, London SE1 9DG (GB).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: MARRIOTT, Philip [GB/GB]; 71 Hobson Street, Macclesfield, Cheshire SK11 8BD (GB).

(74) Agent: GILL JENNINGS & EVERY; Broadgate House, 7 Eldon Street, London EC2M 7LH (GB).

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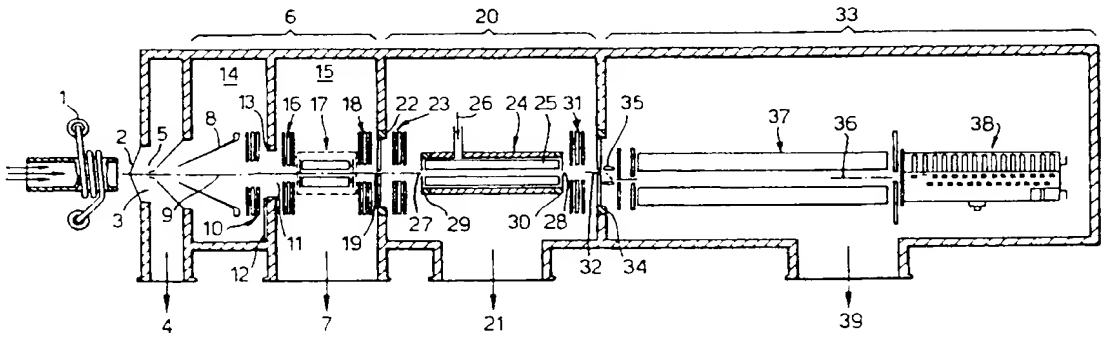

(57) Abstract

The present invention relates to inductively coupled plasma mass spectrometry (ICPMS) in which a collision cell is employed to selectively remove unwanted artefact ions from an ion beam by causing them to interact with a reagent gas. The present invention provides a first evacuated chamber (6) at high vacuum located between an expansion chamber (3) and a second evacuated chamber (20) containing the collision cell (24). The first evacuated chamber (6) includes a first ion optical device (17). The collision cell (24) contains a second ion optical device (25). The provision of the first evacuated chamber (6) reduces the gas load on the collision cell (24), by minimising the residual pressure within the collision cell (24) that is attributable to the gas load from the plasma source (1). This serves to minimise the formation, or re-formation, of unwanted artefact ions in the collision cell (24).